

The reaction of phosphorylation of trans-aconitic acid by tertiary phosphines

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2018, © 2018 Taylor & Francis Group, LLC. New stable carboxylate phosphobetaines were synthesized by the phosphorylation of trans-aconitic acid by tertiary phosphines. The structures of the isolated compounds were determined by NMR spectroscopy, X-ray single crystal diffraction studies and elemental analysis.

<http://dx.doi.org/10.1080/10426507.2018.1539999>

Keywords

(E)-prop-1-ene-1,2,3-tricarboxylic acid, carboxylate phosphobetaines, phosphorylation

References

- [1] Galkin, V. I.; Bakhtiyarova, Yu. V.; Zaripova, A. N.; Galkina, I. V.; Cherkasov, R. A.; Krivolapov, D. B.; Gubaidullin, A. T.; Litvinov, I. A.; Pudovik, A. N. Phosphobetaines on the Basis of Triphenylphosphine and Unsaturated Dicarboxylic Acids. *Phosphorus, Sulfur Silicon Relat. Elem.* 2002, 177, 2063–2065. DOI:10.1080/10426500213350.
- [2] Galkin, V. I.; Bakhtiyarova, Yu. V.; Sagdieva, R. I.; Galkina, I. V.; Cherkasov, R. A. The Synthesis and Reactions of Betaines Formed in Reactions of Tertiary Phosphines with Unsaturated Carboxylic Acids and Their Derivatives. *Heteroatom Chem.* 2006, 17, 557–565. DOI:10.1002/hc.20276.
- [3] Bakhtiyarova, Yu. V.; Sagdieva, R. I.; Galkina, I. V.; Galkin, V. I.; Cherkasov, R. A.; Krivolapov, D. B.; Gubaidullin, A. T.; Litvinov, I. A. Carboxylate Phosphobetaines Based on Tertiary Phosphines and Unsaturated Dicarboxylic Acids. *Russ. J. Org. Chem.* 2007, 43, 207–213. DOI:10.1134/S1070428007020091.
- [4] Bakhtiyarova, Y. V.; Bondar, M. S.; Galkina, I. V.; Galkin, V. I. *Uchenye Zapiski Kazanskogo Universiteta. Seriya Estestvennye Nauki* 2008, 150, 42–55.
- [5] Bakhtiyarova, Y. V.; Minnullin, R. R.; Galkina, I. V.; Cherkasov, R. A.; Galkin, V. I. *Russ. J. Gen. Chem* 2010, 80, 2047–2041. DOI:10.1134/S1070363215090042.
- [6] Bakhtiyarova, Y. V.; Aksunova, A. F.; Minnullin, R. R.; Galkina, I. V.; Galkin, V. I. New di- and Tricarboxylate Phosphobetaines. *Russ. Chem. Bull.* 2016, 65, 1308–1312. DOI:10.1007/s11172-016-1453-5.
- [7] Bakhtiyarova, Y. V.; Minnullin, R. R.; Morozov, M. V.; Bakhtiyarov, D. I.; Islamov, D. R.; Dobrynin, A. B.; Kataeva, O. N.; Cherkasov, R. A.; Galkin, V. I.; Galkina, I. V. Synthesis, Structure, and Biological Activity of Dicarboxylate Phosphobetaines. *Phosphorus, Sulfur Silicon Relat. Elem.* 2016, 191, 1633–1636. DOI:10.1080/10426507.2016.1223660.
- [8] Bakhtiyarova, Y. V.; Minnullin, R. R.; Bakhtiyarov, D. I.; Morozov, M. V.; Ivshin, K. A.; Galkina, I. V.; Kataeva, O. N.; Galkin, V. I. The Influence of Solvents on the Alkylation of Carboxylate Phosphobetaines with Alkyl Iodides. *Russ. J. Gen. Chem.* 2017, 87, 2789–2793. DOI: 10.1134/S1070363217120064.
- [9] Bruker. APEX3 Crystallography Software Suite; Bruker AXS, Inc.: Madison, WI, USA, 2016.
- [10] Bruker. SAINT Crystallography Software Suite; Bruker AXS, Inc.: Madison, WI, USA, 2016.
- [11] Sheldrick, G. M. A Short History of SHELX. *Acta Crystallogr. A Found. Crystallogr.* 2008, 64, 112–122. DOI:10.1107/S0108767307043930.
- [12] Sheldrick, G. M. *TWINABS*, Version 2012/1; Georg-August-Universität Göttingen, Göttingen, Germany, 2012.